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Apparatus & method for re-circulating potable liquid

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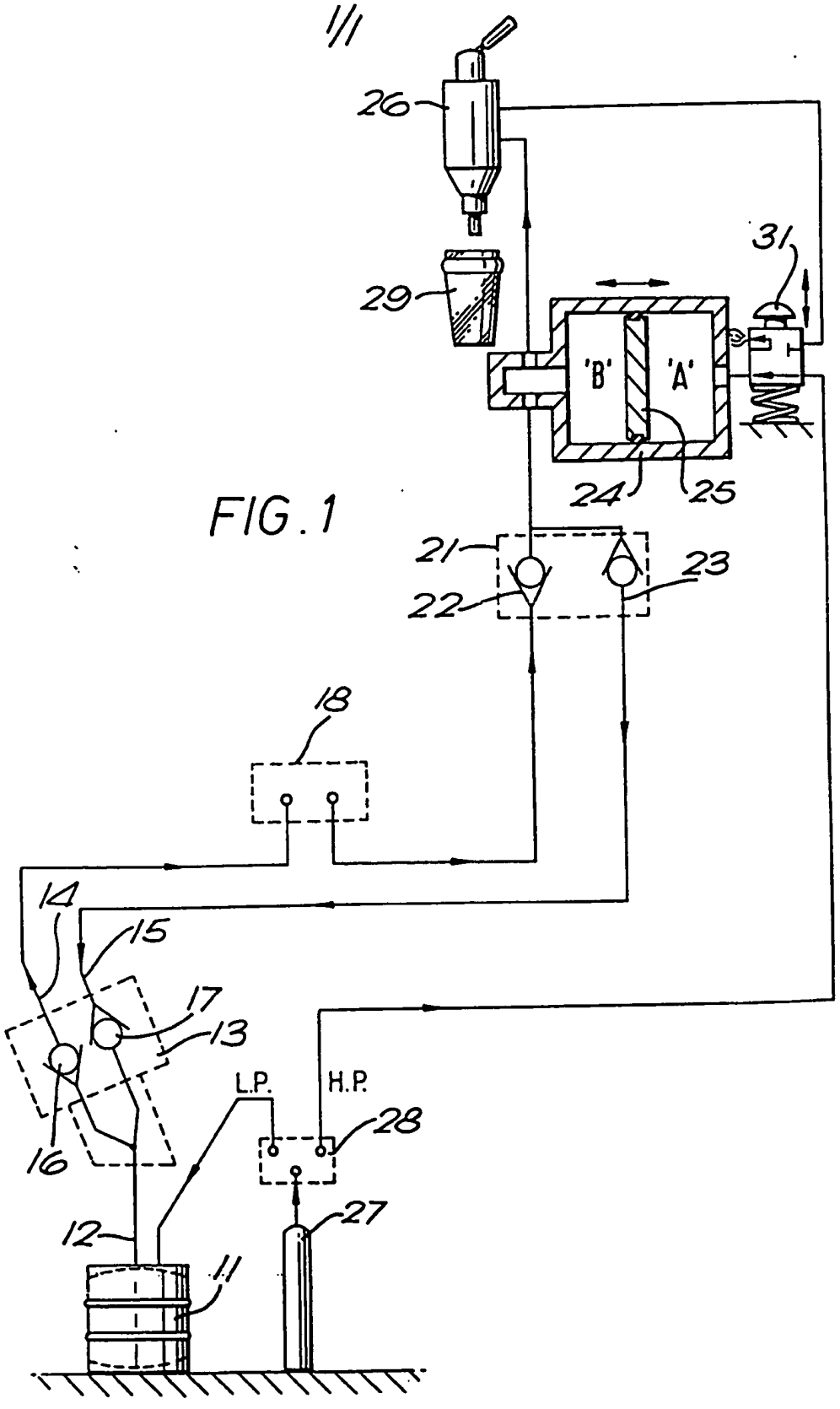

FIG. 1

APPARATUS & METHOD FOR RE-CIRCULATING POTABLE LIQUID

This invention relates to a method and apparatus for cooling beer, lager and the like to be dispensed at a bar.

One of the problems in the dispensing of chilled beers and lagers is that the dispensing system remains charged with the beer or lager at all times ready for instant dispensing when the dispensing tap is opened. When there are long periods between dispensing operations, for example over night or between bar opening hours, that section of piping containing cooled beer that has passed through the cooler begins to warm due to the higher ambient temperature. In such a situation when the tap is eventually operated, it does not dispense cooled beer or lager with the result that the first measure fobs badly and is unsaleable.

This problem has been addressed by breweries in a number of ways, for example by pipe insulation or by placing the cooler close to the dispenser, or by using re-circulating water jackets, but wastage still occurs.

An object of the present invention is to provide an improved means and method for overcoming this problem.

According to the invention there is provided apparatus for re-circulating potable liquid from a portion of a fluid supply duct, said duct running from a reservoir via a cooler to a dispenser, the apparatus comprising a non-return valve for said supply duct, a return duct for connection between said supply duct at a point downstream of the cooler and said reservoir, a non-return valve for said return duct, and a pump; in use said portion being between said cooler and the junction of supply and return ducts, and said pump being located between said non-return valves. The invention also provides a liquid supply installation comprising a supply duct, a non-return valve in the supply duct, a cooler for liquid in the supply duct, a return duct connected to the supply duct downstream of the cooler, a non-return valve in the return duct, a liquid dispenser downstream of the cooler and a liquid pump between the non-return valves.
If the pump is actuated whilst the dispenser is closed the non-return valves ensure that the liquid is pumped around the fluid circuit via the cooler and return duct to the reservoir. In this way the portion of supply duct downstream of the cooler can be replenished with cool liquid. Clearly the junction of supply and return ducts should be placed as close as practicable to the dispenser in order to

minimise the volume of beer which cannot be re-circulated.

In a preferred embodiment the liquid is beer or lager and the pump is located close to the dispenser where it can be operated by the barman when warm beer is suspected. The pump may be a single cylinder with a reciprocable piston actuated by high pressure gas from the bar supply. In the preferred embodiment the piston is returned by the relatively low pressure of beer in the supply duct.

The pump control may be a valve controlled by a push button and in which the pump is normally connected to a high pressure gas supply so that the pumping chamber is exhausted. On actuation, the gas supply is isolated by the valve and the actuation chamber connected to exhaust, the pumping chamber consequently filling with beer from the supply duct. Release of the push button re-connects high pressure gas to the actuation chamber so forcing beer from the pumping chamber via the return line to the reservoir (beer barrel).

The pump need not be located adjacent the dispenser but may be remotely mounted and actuated. However by mounting the pump adjacent the dispenser, the apparatus may be simply added to existing bar dispenser and actuated by the existing bar gas supply. Clearly the non-return valves are adapted to

the particular gas pressure used and where spring-loaded valves are utilised, the spring loading in the return line is arranged to be just sufficient to resist normal beer supply pressure. Where self-contained ready-pressurised kegs are provided a separate gas supply can be located in the bar area. Practical considerations and the need to use existing equipment may mean that additional non-return valves are provided to allow, for example, for cleaning or to prevent overnight draining of the return duct. Such valves are shown in the preferred embodiment described herein.

The invention also provides a method of re-circulating potable liquid using the apparatus aforesaid.

Installations in bars vary enormously as do the length of supply ducts and the position of coolers. However the present invention provides an economical and straightforward solution to a problem which has caused considerable difficulties in the trade for many years.

Other features of the invention will be apparent from the following description of a preferred embodiment shown by way of example only in the accompanying drawing which illustrates a schematic arrangement of a beer delivery and return system.

With reference to the drawing there is shown a beer barrel 11 having a beer outlet 12 from which beer passes to a valve block 13 having a supply outlet 14 and a return inlet 15; the supply and return lines have respective non-return valves 16 and 17. The supply line passes through a cooler 18 of any conventional type to a second valve block 21; the return line connects the valve blocks and again respective non-return valves 22, 23 are provided. A single fluid line leads from the second valve block 21 to a pump 24 having a reciprocal piston 25. An outlet from the pump leads to the usual beer dispensing tap 26. A gas supply 27, usually a bottle of carbon dioxide has a conventional metering unit 28 which supplies low pressure gas to the beer barrel and high pressure gas to the dispensing tap. Low pressure gas is used to force beer from the barrel to the tap and high pressure gas is used to control the flow of beer from the tap to the glass 29 as described for example in European Patent Publication 0300701 or to a conventional tap 26 with the facility to site the pump 24 right on to the tap's beer inlet connection. High pressure gas is supplied to the pump unit 24 via a valve unit 31 which is under the control of the barman. In its usual condition the valve 31 allows gas into chamber A of the pump, forcing the piston fully leftwards as viewed, the volume of chamber B is consequently minimal.

During busy periods the barman dispenses beer in the usual manner, beer being forced under low pressure from the barrel to the tap via the cooler. The non-return valve 23 is spring loaded sufficiently to resist beer entering the return line . After a period of tap inactivity the beer upstream of the cooler will increase in temperature. In these circumstances the barman will operate valve unit 31 to shut off the gas supply and connect chamber 'A' to exhaust; the piston will move rightwards as viewed under the effect of low pressure beer in the supply line. Once chamber 'B' is full the barman re-pressurizes chamber 'A' and beer is forced via valves 23 and 17 to the beer barrel, the dispensing tap being closed during this time. Warm beer upstream of the cooler is thus returned to the barrel and the barman may repeat the operation as many times as is necessary to ensure that cold beer is ready for supply.

Clearly in the design of equipment according to the invention it is desirable to minimise the volume of the supply pipe downstream of the junction of supply and return pipes. If practicable it would be advantageous to connect the return line to a point immediately adjacent the dispensing tap rather than upstream of the pump as shown. The exact location of the pump is not critical provided it can force warm

beer into the return line.

The arrangement is of course suitable for other drinks normally supplied in a cooled state and which can safely be re-circulated to the reservoir. Alternatively the same system could be used to re-circulate other liquids, such as milk, to a waste container.

CLAIMS

1. Apparatus for re-circulating potable liquid from a portion of a fluid supply duct, said duct running from a reservoir via a cooler to a dispenser, the apparatus comprising a non-return valve for said supply duct, a return duct for connection between said supply duct at a point downstream of the cooler and said reservoir, a non-return valve for said return duct, and a pump; in use said portion being between said cooler and the junction of supply and return ducts, and said pump being located between said non-return valves.

2. A liquid supply apparatus comprising a supply duct, a non-return valve in the supply duct, a cooler for liquid in the supply duct, a return duct connected to the supply duct downstream of the cooler, a non-return valve in the return duct, a liquid dispenser downstream of the cooler and a liquid pump between the non-return valves.

3. Apparatus according to claim 1 or 2, wherein the pump is a single cylinder with a reciprocable piston arranged for actuation by high pressure gas.

4. Apparatus according to claim 3, wherein the pump may be actuated by a pump control valve controlled by a push button.

5. Apparatus according to any one of claims

1 to 4, wherein the apparatus is adapted to receive the pump at a position so as to be located adjacent the dispenser.

6. A method of re-circulating potable liquid from a portion of a fluid supply duct, said duct running from a reservoir via a cooler to a dispenser, said method comprising the steps of:

providing a non-return valve for said supply duct;

providing a return duct connected between the supply duct; at a point downstream of the cooler, and the reservoir, the return duct having a non-return valve;

locating a pump between the valves of the supply duct and the return duct; and,

actuating the pump whilst the dispenser is closed whereby liquid in the supply duct downstream of the cooler is pumped via the return duct to the reservoir and said portion of the supply duct is replenished with cool liquid.

7. A method according to claim 6, wherein the liquid is beer and the pump is manually operable for actuation by high pressure gas.

8. A method according to claim 7 or 8, and substantially as hereinbefore described with reference to the accompanying drawing.

9. Apparatus for re-circulating potable liquid substantially as hereinbefore described with reference to the accompanying drawing.

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